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of a system on adjacent and on remote parts of the plant. When either the root or the shoot system was incased, a plain retardation of the growth of the free system was always seen. This retardation differed somewhat from that observed when the part was simply amputated. Instead of a recovery following the shock from the injury, the author found that the continued irritation from the confined parts caused a likewise continued retardation with a total growth (in the case of the radicle) averaging about two-thirds of that of the control. Upon freeing the confined parts, a plainly marked acceleration of the growth rate of both systems followed.

The cotyledons of Streptocarpus behaved in a very interesting manner. Normally one cotyledon grows until it reaches considerable dimensions. The other, however, remains rudimentary, and finally dies. When the cotyledon in the usual order of things predestined to development was put in the cast, the smaller usually fugacious member assumed the rôle and grew, provided the development of the seedling had not already proceeded too far. A similar result was obtained by the extirpation of the larger cotyledon. Thus the prevention of growth in one part can awaken it in another.

The question of correlation within a particular system was investigated. If the cast was so placed as to leave free the apex and entire growing zone of a radicle, a retarded growth resulted. Neither the revival of growth in old tissues, nor a changed distribution of growth was found to follow the application of the cast preventing normal elongation. When only partially hindered, growth was reduced but not re-localized.

When shoots of various kinds of seedlings were correspondingly treated, the correlation phenomena agreed completely with those seen in roots. Shoots so enclosed that growth in length merely was prevented, grew abnormally in thickness, but on the release from the cast it was resumed in the parts still plastic.

From these results, it appears that, without sufficient development in the sustaining parts, the sustained meristematic regions are unable to make a strong development.—R. H. TRUE.

Fertilization of Batrachospermum.

In the *Annals of Botany* (March) Dr. Bradley M. Davis has recorded some important results from his study of the fertilization of Batrachospermum. The species chiefly studied was *B. moniliforme*, subsequently checked by a study of two other species, *B. coerulescens* and *B. Boryanum.* The results have to do not merely with the genus studied but with the whole subject of fertilization. The trichogyne of Batrachospermum is found to be a cell entirely distinct from the so-called carpogonium, as witnessed by its well-organized nucleus and its chromatophore. The antherozoids also contain a chromatophore derived from the vegetative cells, and a distinct nucleus. In the act of fertilization the antherozoid and trichogyne walls fuse, a larger or smaller opening is developed, and cytoplasmic fusion occurs, but the antherozoid and trichogyne nuclei remain distinct, apparently indifferent to the process, the antherozoid nucleus for the most part not even entering the trichogyne. As soon as cytoplasmic fusion occurs the trichogyne becomes separated from the carpogonium by the gradual drawing apart of the cell-contents until the connecting strand becomes so thin that it breaks, and by a deposit of substance similar to cell-wall material. The carpogonium subsequently gives rise to the spore-producing filaments. The nuclei of the antherozoid and of the trichogyne were repeatedly observed in various stages of fragmentation after fertilization had been accomplished. The striking results are the distinct cell-nature of the trichogyne, and the process of fertilization, consisting as it does of fusion which does not involve the nuclei. That all fertilization hitherto observed involves cytoplasmic fusion as well as nuclear is well-known; but that it should be so modified as to involve the former and not the latter is entirely unexpected. It is not necessary to conclude that nuclear fusion may not be an essential feature of well-organized fertilization, for these observations upon Batrachospermum may indicate, as Dr. Davis suggests, that the genus is losing its sexual habit, and is tending toward apogamy. Even if this be true, however, the puzzling feature still remains that the carpogonium will not produce its fertile filaments, as clearly shown by experiments, without the antherozoid contact. It is evident, therefore, that the fusion, even if the nuclei are not concerned, shows its sexual character in its effect. The author also suggests the hypothesis that sexual reproduction in these low forms may not of necessity involve nuclear fusion. We certainly know too little concerning the behavior of the nuclei in the sexual processes of the thallophytes in general, and concerning the whole trichogyne subject in particular, to venture upon much generalization concerning these very interesting and important observations upon Batrachospermum.